
MEMORANDUM

TO: Washington Department of Ecology
FROM: Area-Wide Soil Contamination Project Consultant Team
DATE: January 29, 2002
SUBJECT: Draft Information Survey Approach for Area-Wide Soil Contamination Project

In accordance with the scope of work and deliverable schedule for contract number C0200196, this memorandum provides the Washington State Department of Ecology (Ecology) with the proposed approach to the Area-Wide Soil Contamination Project information survey. This document is the first deliverable for the information survey, which is detailed in Tasks 3.3, 4.3, and 5.2 of the contract scope of work.

The remainder of this memorandum is organized as follows.

- Section 1 provides background and a brief overview of the project.
- Section 2 identifies the goals of the information survey and the primary information collection needs.
- Section 3 describes the survey approach and outlines a set of survey protocols.
- Section 4 describes the interview portion of the information survey with proposed information survey contacts and proposed survey questions
- Section 5 describes the literature search portion of the information survey.
- Section 6 describes how the results of the information survey will be documented and applied to the Area-Wide Soil Contamination Project.

Section I – Background and Overview

Soil in large areas of Washington State is contaminated with low-to-moderate levels of contaminants, including arsenic and lead, caused by a range of historical activities. As Washington's population has grown, many of these areas have been developed into residential neighborhoods, schools, and parks. These development activities have created pressures for cleanup and raised a variety of health, environmental, and marketplace concerns.

In response to these concerns, the Departments of Ecology, Agriculture, and Health and the Office of Community Development (the Agencies) have decided to examine these issues and concerns and develop a statewide strategy for responding to widespread low-to-moderate level soil contamination problems, with an initial focus on arsenic and lead. The project will study the nature and geographic extent of area-wide soil contamination in Washington, identify feasible measures to protect human health and the environment, and recommend institutional and regulatory changes to improve how area-wide soil contamination problems are addressed.

To assist them in addressing these issues, the Agencies have chartered a Task Force to address issues of area-wide soil contamination in Washington State. The Area-Wide Soil Contamination Task Force will work with two work groups and a consultant team to develop recommendations for the chartering agencies by June 2003 on a statewide strategy to respond to area-wide soil contamination problems.

During the course of the project, the Agencies and the consultant team will also develop and implement a public involvement plan to educate the public and provide opportunities for public participation in the project.

The information survey is one of the first steps in the Area-Wide Soil Contamination Project. Information gathered during the interviews and literature reviews of the information survey will be used to define and frame the analysis of area-wide soil contamination problems in Washington state and options for addressing those problems. In particular, during the interviews we will focus on:

- Identifying innovative solutions, especially those that move beyond traditional Federal and state cleanup frameworks.
- Outlining lessons about what types of approaches have (or have not) worked in addressing area-wide soil contamination problems and similar cleanup or public health challenges.
- Building a network of contacts upon whom we can rely for further information and advice as the project unfolds.

Section II – Survey Goals and Information Needs

The primary goal of the information survey is to identify and gather information on the status and content of past, current, and proposed area-wide soil contamination projects, public health initiatives, and cleanup activities in other states and countries that might be applied to area-wide soil contamination problems in Washington state.

Within this broad goal, the information survey is oriented around the three primary areas of analysis for the Area-Wide Soil Contamination Project. First, improving our understanding of the sources of contamination and the nature and geographic extent of area-wide soil contamination problems (geographic/geochemical assessment or Task 3). Second, identifying feasible measures for protecting the health of people who live and work on or near properties that contain widespread low-to-moderate levels of soil contamination (remedy selection or Task 4). Third, identifying current institutional frameworks (e.g., laws, regulations, land use planning processes, etc.) and new initiatives that will improve efforts to reduce risk to public health posed by widespread low-to-moderate level soil contamination and remediate existing threats.

The primary objective for the geographic/geochemical assessment (Task 3) portion of the information survey is to gather information on potential sources of contamination and methods used to characterize the nature and extent of area-wide contamination of soil by arsenic, lead, or other similar contaminants. Primary information needs include:

- Identification of historical resources used to determine where area-wide contamination was likely to be found.
- Identification and characterization of sampling approaches and analytical methods used to characterize area-wide soil contamination problems in a cost effective manner.
- Identification of the nature and extent of arsenic and lead area-wide contamination in other states.

The primary objective of the remedy selection (Task 4) portion of the information survey is to gather information on remedies that have been considered, selected, and implemented to address widespread contamination of soil by arsenic, lead, or other similar contaminants. Information gathering will focus on identification of technically feasible remedies (including individual protective measures) and their cost, implementability, and effectiveness.

The primary objective of the institutional frameworks (Task 5) portion of the information survey is to gather information on the strengths and weaknesses of institutional approaches to implement solutions to area-wide soil contamination problems. Information needs include the following topics:

- The possibilities and limitations of solutions tied to real estate transactions (development, ending), local land use and planning ordinances, and other mechanisms.
- How innovative approaches to brownfields redevelopment might apply to area-wide soil contamination.
- What alternatives under state and federal cleanup laws might be utilized further to address area-wide soil contamination (for example, prospective purchaser agreements for the development of formerly agricultural lands)?

Section III – Survey Approach and Protocols

Our approach to the information survey is guided by four principles.

First, start with a *broad range of interview contacts*. To ensure exposure to a diversity of perspectives, our range of survey contacts includes professionals in research and academia, in state, Federal and local government departments and agencies, and among the larger community of stakeholders around area-wide soil contamination problems (e.g., community groups that have been involved in area-wide cleanups).

Second, use an *iterative approach*. We plan to interview ten to twenty survey contacts over the next thirty to forty-five days; however, we will not identify all survey contacts in this memorandum. Each initial survey contact will be asked to suggest other contacts. From these suggestions, we will continue to identify new survey contacts throughout the survey. This iterative approach is important to our ability to build on information received during initial interviews and to follow relevant information leads as the project unfolds.

Third, be open to *learning from other relevant cleanup and public health challenges*. While we plan to focus on area-wide soil contamination by lead and arsenic (and other relatively non-mobile, persistent contaminants), we recognize that there may not be many area-wide soil contamination initiatives that have been brought to completion – or even begun. For that reason, we will be open to learning from approaches to other relevant cleanup and public health challenges. For example, experiences with institutional controls and other institutional approaches in state brownfield programs may be relevant to the institutional frameworks (Task 5) portion of the information survey.

Fourth, use an *integrated approach* to surveying across the three Task areas. We propose to ask each survey contact a variety of questions across all Task areas. For continuity and efficiency, Ross & Associates staff will carry out all initial interviews. Other Task managers may follow-up with individual contacts as warranted.

The following outline describes our protocols for preparing for and carrying out the information survey interviews.

1.0 Identification of Survey Participants

- 1.1 Task Managers have developed an initial list of potential survey contacts and provided them to Ross & Associates staff.
- 1.2 Ross & Associates staff has consolidated, organized, and revised the list of potential contacts and provided them to Ecology for review.
- 1.3 Based on this review, the list of potential contacts was revised.
- 1.4 Revised list of potential contacts will be provided to the Area-Wide Soil Contamination Task Force and Work Groups for review and, based on this review, revised as necessary.
- 1.5 Ross & Associates staff will make the first call to each potential survey contact to determine whether the contact will be useful and is willing to participate. During this first call, Ross & Associates staff will:
 - 1.5.1 Identify self, affiliation, and purpose of call.
 - 1.5.2 Determine whether person could provide useful input and is willing to participate. (If person is not willing or able to provide useful information, Ross & Associates staff will ask for alternative contacts.)
 - 1.5.3 Determine what general times are best and if appointment needs to be scheduled.
 - 1.5.4 Keep initial call no longer than 5 minutes.
- 1.6 Based on results of initial calls, Ross & Associates staff will revise contact list and provide to Task Managers and Ecology for review as necessary.

2.0 Identification of survey questions

- 2.1 Task Managers have prepared draft survey questions organized by topic and provided them to Ross & Associates staff.
- 2.2 Ross & Associates staff has consolidated, organized, and revised the questions as appropriate for the interviews and provided them to Task Managers and Ecology for review.
- 2.3 Based on this review, Ross & Associates staff has revised the interview questions.
- 2.4 Revised interview questions will be provided to the Area-Wide Soil Contamination Task Force and Work Groups for review and, based on this review, will be revised as necessary. (This memorandum.)

3.0 Surveying

- 3.1 Ross & Associates staff will schedule interviews with all survey contacts.
- 3.2 Ross & Associates staff will e-mail or fax interview questions to survey contacts before each scheduled interview.
- 3.3 During each interview, Ross & Associates staff will:
 - 3.3.1 Identify self, affiliation, and purpose of call.
 - 3.3.2 Summarize project background and survey objectives.
 - 3.3.3 Ask survey questions in order.
 - 3.3.4 Ask for suggestions for other survey contacts.
 - 3.3.5 Request backup documentation as appropriate.
 - 3.3.6 Secure follow-up opportunity if other questions arise.
- 3.4 Ross & Associates staff will take handwritten (or typed) notes during each interview. These interview notes will be used in developing the Information Survey Summary Report (see Section 6, later in this memorandum), and copies of the interview notes will be provided to appropriate Task Managers.

- 3.5 After each interview, Ross & Associates staff will send a follow-up e-mail to thank each survey contact for their time and provide contact information for any follow-up.

At completion of the information survey, Ross & Associates staff will prepare a report summarizing the survey results. This is discussed in more detail in Section 6 of this memorandum.

Section IV – Interviews

The interviews for the information survey are designed to elicit insights about area-wide soil contamination problems in Washington State from individuals who have studied and/or addressed these or similar problems in other states and countries. Not only will the interviews provide examples of methods to characterize area-wide soil contamination and of protective measures and institutional arrangements to address area-wide soil contamination problems, they will also lead to further references on these topics.

Interview Contacts

The interview contacts are organized into three sectors: research and academia, government, and nongovernmental stakeholders. Each sector is discussed below.

Contacts in Research and Academia

The research and academia category is made up largely of scientists and other professionals who study area-wide soil contamination problems and solutions or related issues. Suggested contacts were drawn largely from associations and references developed from previous work on area-wide contamination issues associated with Tacoma and Everett smelters and from our general cleanup program background and experience.

Contacts in Research and Academia			
Name	Title	Organization	Notes
Dr. Robert Wershaw		U.S. Geological Survey, Arsenic Studies Group	Arsenic Dr. Wershaw is head of the USGS Arsenic Studies Group See website at: http://www.brr.cr.usgs.gov/Arsenic/
Dr. Peter Veneman		University of Massachusetts (Amherst), Plant and Soil Sciences Dept.	Orchard Veneman is head of Soil Science Dept. Gave a paper <i>Arsenic Distribution in Massachusetts Orchard Soils</i> at 2001 UMASS annual <u>Contaminated Soils, Sediments and Water Conference</u> . Frank Peryea is aware of his work. http://www.umasssoils.com/abstracts/tuesday/arsenic.htm (Dr. Edward Calabrese is an alternative contact at U. Mass.)
Dr. Lena Ma		University of Florida, Soil and Water Science Dept.	Area-wide Background Recently published paper on background concentrations of arsenic in Florida soil. Discovered brake fern as a phyto-remediation tool. Recommended by Frank Peryea as possible contact. Her homepage is: http://www.ifas.ufl.edu/~qma/LQMa.html
Ian Merwin		Cornell University	Orchard Recommended by Frank Peryea as most active in the field concerning orchards. His homepage is:

Contacts in Research and Academia			
Name	Title	Organization	Notes
Ravi Naidu		CSIRO	http://www.hort.cornell.edu/merwin/ Areawide Arsenic – Research Dr. Naidu was recommended by Frank Peryea. He is a researcher at CSIRO, an Australian Research Institute. He was program chair for 2001 Arsenic in Asia Workshop (http://www.clw.csiro.au/conferences/arsenic/) and should be familiar with cleanup efforts at smelter sites in New Zealand.

Government Contacts

The government category is made up largely of representatives of state, Federal, and local agencies or departments that are or have been responsible for implementing or overseeing investigations and/or remedial actions at former smelters and in former agricultural areas. Suggested contacts were drawn largely from associations and references developed from previous work on area-wide contamination issues associated with Tacoma and Everett smelters and from our general cleanup program background and experience.

Government Contacts			
Name	Title	Organization	Notes
Barbara O'Grady		Colorado Dept. of Public Health & Environment, Hazardous Materials & Waste Management Division	Globe Smelter/ I-70 Site, Denver, CO Smelter operated between 1890 and 1993. Constituents of concern (COCs) are arsenic, lead, cadmium, and zinc. About 550 homes remediated. Medical monitoring program. Proposed Superfund Site. Reference from Greg Glass. See health department web site at: http://www.cdphe.state.co.us/hm/rpglobe.asp
Michael Storck	Project Manager	Utah Dept. of Environmental Quality	Murray Smelter, Superfund Site, Murray, Utah Lead smelter operated between 1872 and 1949. COCs are lead and arsenic. Site remediation and residential property remediation. Superfund site. Reference by Greg Glass w/ note about innovative institutional controls. See EPA web site at: http://www.epa.gov/region08/superfund/sites/ut/murray_.html
Charles Coleman	Project Manager	EPA, Montana Office	Anaconda Ore Processing Facilities, Superfund Site, Anaconda, MT Smelter and other facilities operated from about 1884 to 1980. Arsenic primary COC. Approximately 300 square miles contaminated. Superfund site suggested by Greg Glass. May want to contact state instead of EPA. See EPA web site at: http://www.epa.gov/region08/superfund/sites/mt/anacon.html
Jerry Cobb		Panhandle Health District	Bunker Hill Mining and Metallurgical Site Smelter operated between 1917 and about the 1970s. Lead primary COC. Mentioned as largest Superfund site in the country. CDC, ASTDR studies. Many people involved. Greg Glass recommended Jerry Cobb. Also recommended consultant – Ian Von Lindern at Terragraphics in Moscow, ID. See EPA web site at: http://yosemite.epa.gov/r10/cleanup.nsf/6ea33b02338c3a5e882567ca005d382f/1a829ac00e6d429e882566290004a644?OpenDocument#top
Dr. Eilene Murphy	Assistant Dir. Division of Science, Research	New Jersey Dept of Environmental Protection	The NJ DEP did extensive work on the distribution and cause of arsenic from agricultural activities. The final report was published in 1999. Ms. Murphy was a primary author of the referenced technical journals.
Cheryl Yates		Kootenay Boundary Community	Area-wide Smelter, Completed Task Force Process The Trail, B.C smelter operated since the beginning of the century. Task Force was formed in 1990 with a goal of reducing children's

Government Contacts			
Name	Title	Organization	Notes
		Health Services Society	blood lead levels and completed its work on 1/1/2001 – see: http://mypage.direct.ca/t/tp/page17.html . Cheryl Yates has been with the project since 1989 and works with the Kootenay Boundary Community Health Services Society and is the current program contact.
Robbie Morris		California EPA, Dept. of Toxic Substances Control	California has enacted legislation requiring environmental assessments of proposed school sites, many of which are on land previously used for agriculture. Robbie Morris is the point of contact for CalEPA's Schools Property Evaluation and Cleanup Division.

Nongovernmental Stakeholder Contacts

The nongovernmental stakeholders category is made up of interest groups that have participated in stakeholder processes to study and address area-wide soil contamination problems (or related issues) or that would be able to provide leads to nongovernmental participants of such processes. Suggested contacts are drawn largely from national, state, and international professional and policy research associations that represent banking, real estate, planning, and development interests.

Nongovernmental Stakeholder Contacts			
Name	Title	Organization	Notes
Stuart Cameron	Executive Vice President and Director of Government Relations	New Jersey Bankers Association	Stuart Cameron participated in the New Jersey Historic Pesticide Contamination Task Force, which was formed to help identify technically and economically viable protective strategies for sites with widespread soil contamination due to pesticides use. In addition to providing information on the deliberations and findings of that task force, Mr. Cameron may be able to direct us to additional banking associations or financial institutions that have worked with local and state governments to finance the redevelopment of areas with area-wide contamination problems.
Greg DeLozier	State Legislative Director	New Jersey Association of Realtors	Greg DeLozier participated in the New Jersey Historic Pesticide Contamination Task Force described above. In addition to providing information on the deliberations and findings of that Task Force, he should be able to direct us to additional real estate associations or developers that have considered issues related to the development of former agricultural lands.
Elizabeth Stasiak	Project Manager, Brownfields Best Practices	International City/County Management Association (ICMA)	ICMA has extensively researched brownfields programs in the U.S. and around the world and should be able to direct us to innovative case studies relevant to area-wide soil contamination issues. An alternative resource would be Linda Garczynski, who directs EPA's Brownfields Initiative.
Jeff Soule	Director of Policy	American Planning Association (APA)	APA is a public interest and research organization associated with the American Institute of Certified Planners. APA should be able to direct us to local governments or other stakeholders who have dealt with planning issues related to sites with low-to-moderate level soil contamination.

Interview Questions

The interview questions are designed to elicit general information about contacts' knowledge, expertise, and experience, to gather specific information and references in areas related to project information needs, and to provide open-ended opportunities for contacts to share their experience and insight. Each interviewee will be asked the following questions, in order.

Interview Questions

The interview questions are designed to elicit general information about contacts' knowledge, expertise, and experience, to gather specific information and references in areas related to project information needs, and to provide open-ended opportunities for contacts to share their experience and insight. Each interviewee will be asked the following questions, in order.

Subject Knowledge and Experience

1. Please describe your experience and familiarity with the investigation and/or remediation of large areas of widely dispersed low-to-moderate levels of soil contamination (e.g., former agricultural lands, "brownfields" in urban areas, smelter sites, or mining sites).
 - a. What were the major contaminants, sources, and areas involved? What were the depths at which the contamination was observed and the extent of the area involved?
 - b. If arsenic or lead contamination is a widespread contamination issue, how is arsenic and lead contamination defined (i.e., what are the regulatory levels and what are the background concentrations)?
 - c. Was the source of contamination either historical use of pesticides in orchards and/or aerial deposition of contaminants from smelters? Or were the widespread contamination problems due to other types of sources such as urban lead (related to use of leaded gasoline), incinerators, coal-fired plants, or other agricultural sources (e.g., field crops)?

Characterizing Contamination Problems

2. Have you done any regional-scale or area-wide mapping of contamination based on historical research such as wind patterns, facility operation, air photo analysis, and agricultural records or statistics? Are you aware of any such studies? Are you aware of any other methodologies to characterize area-wide contamination problems outside of field sampling?
3. Have you been involved in field sampling programs to characterize area-wide contamination? If so:
 - a. Were these sampling programs designed to determine the degree of contamination at specific properties or to broadly characterize contamination problems across multiple properties?
 - b. What were the one or two primary sampling design issues and how were they addressed (e.g., the effect of disturbance or development, characterizing depth profile, or spatial variability due to land use or soil type)?

- c. What were the one or two primary surprises or unusual characteristics found in the data once collected, if any (e.g., spatial variability/trends, depth profiles, correlation with other constituents)?
- d. In characterizing area-wide contamination, was there an attempt to characterize area natural background sources of arsenic or lead as well as anthropogenic sources? If so, what are the main natural background sources? Were any trends or unusual variability characterized in natural background?
- e. What other agencies and institutions were involved in the sampling programs? What were the primary sources of funding? What were the major institutional barriers to implementation of the sampling programs and how were those overcome?
- f. Have individuals and/or businesses generally preferred to opt-in or opt-out of the characterization process? That is, have they asked to have their property sampled and/or readily provided access for sampling?
- g. Are you aware of sampling or characterization protocols developed for general applicability to area-wide contamination that have a broad target audience (e.g., local planners and officials, developers, and individual homeowners)? If so, how might we obtain copies of these protocols?

Remedial Alternatives and Protective Measures

- 4. Have you been involved with or are you familiar with efforts to evaluate remedial alternatives or implement remedies at sites with area-wide contamination? (Remedies include activities that are part of the cleanup such as soil treatment, soil excavation, and disposal, as well as institutional controls and other methods to reduce exposure.) If yes, please briefly describe your experience and knowledge of these efforts. What agencies or institutions were responsible for remedy selection? How were remedies evaluated and selected?
- 5. Have you been involved with the design or selection of protective measures that individuals may take to reduce exposure to contaminants prior to cleanup of a site (e.g., voluntary use restrictions or decontamination approaches such as hand washing)? If so, please describe your experience.
- 6. If you have experience with remedy selection, please identify:
 - a. The range of factors/alternatives you considered, the remedy you selected, and the reasons for selecting that remedy.
 - b. The decision-making scale (large scale, property specific, or phased) and the amount of information available to support decisions about remedy selection.
 - c. The cleanup goals and/or levels and the bases for those goals/levels.
 - d. The anticipated cost (preferably unit costs, such as \$/ton or \$/gallon, that include capital and indirect costs but not consultant fees).
 - e. The timeframe in which remediation occurred (or will occur) and the primary determinants (e.g., money) of that timeframe.

- f. A contact name for the remediation contractor for any remedies that involved treatment.
7. If you have experience with remedy implementation, please compare your expectations about cost, implementation, and effectiveness to what you have actually experienced.

Institutional Arrangements and Strategies

8. For any area-wide cleanup sites that you have worked on, please describe:
- a. Who was/is the lead authority/agency for the remediation? What other agencies, institutions, or parties were involved (e.g., federal agencies, state agencies, local governments, associations, and private parties)?
 - b. What communication techniques and strategies were used to educate and/or involve the public in the remediation efforts? What has been the role and/or reaction of the public in addressing widespread contamination issues? What has or has not worked well in terms of public involvement?
 - c. What was the regulatory framework used (e.g., Superfund or state cleanup regulations)? Were any voluntary incentives used?
 - d. Were other institutional frameworks or approaches considered but rejected? If so, why? Were there any institutional barriers encountered that prevented (or had to be overcome to allow for) innovative cleanup solutions?
 - e. What were/are the primary institutional costs for the cleanup efforts and what methods were used to project future costs? What were the funding sources (e.g., grants, loans, tax incentives/exemptions)? Were any unique or innovative funding sources involved?
9. What should the role of government agencies, private organizations, and the public be in the following tasks?
- a. Characterizing the nature and extent of area-wide soil contamination problems
 - b. Evaluating potential protective measures to deal with any public health or environmental risks
 - c. Funding and implementing strategies to address risks (e.g., tools for planning, guidelines for remediation, funding for cleanups, etc.)
10. What do you think are the major institutional barriers to addressing area-wide soil contamination issues? What do you recommend as strategies for overcoming those barriers?
11. Are you aware of new or innovative funding sources or strategies that might be used for area-wide soil contamination problems?

Other

12. If you are not the project manager/contact person for a specific cleanup site, please, if possible, provide the name of a contact person who could answer more detailed questions if they arise later in our project.

13. Are there other people we should talk to about this site or about area-wide cleanups more generally? In particular, are there other state, federal, or local government contacts or contacts with nongovernmental stakeholder groups?
14. Are you aware of any other agencies/entities that are addressing low-to-moderate level, widespread soil contamination? Are you aware of any other innovative remediation projects or public health initiatives that we might want to know about and might be relevant to this area-wide contamination project (e.g., that might make good case studies for our project)?
15. Are you aware of other studies or research that has been done on area-wide contamination issues?
16. Do you have any other comments you'd like make?

Section V – Literature Review

In addition to the interviews, the information survey will incorporate a review of literature pertinent to the three primary areas of analysis for the Area-Wide Soil Contamination Project: (1) geographic and geochemical assessment of area-wide lead and arsenic contamination (Task 3), (2) protective measures available to address public health and environmental risks associated with area-wide soil contamination or similar problems (Task 4), and (3) models of institutional arrangements and processes that might be used to address area-wide soil contamination problems (Task 5). The three concurrent literature reviews will complement the interviews by providing a broader knowledge base about area-wide soil contamination problems and potential solutions. They will help frame future analysis of alternatives and guide the development of recommendations.

The literature review for Task 3 will focus on methods used to identify potentially affected areas, characterization methodologies for arsenic and lead contamination, and issues involved with identifying natural background concentrations. Review and comparison of previous efforts to do geographic/geochemical assessments of contamination of soil with arsenic, lead, and similar constituents will guide the analysis and decision making in the efforts to characterize area-wide soil contamination problems in Washington.

The literature review for Task 4 will focus on the effectiveness and cost of individual measures to reduce exposure and on remediation alternatives. It will survey the status of current and proposed remedial activities, identify information products available on individual measures, and highlight the key technical issues in the analysis and development of model remedies.

The literature review for Task 5 will focus on regulatory, institutional, and funding approaches that have been or are currently used to address area-wide soil contamination or similar problems in other states. It will also examine institutional alternatives that have been proposed or considered but not necessarily implemented. This literature review will provide a broader base of knowledge to select case studies and principles for evaluating institutional approaches.

Section VI – Application of the Information Survey Results and Next Steps

The information gleaned from the interviews and literature reviews in the information survey will be used to inform future project work related to the geographic/geochemical assessment of area-wide arsenic and lead soil contamination, practical and cost-effective measures to protect human health and the

environment, and institutional alternatives or processes to fund and implement solutions to area-wide soil contamination problems.

For geographic/geochemical assessment (Task 3), future project work that will be informed by the interviews and literature reviews includes defining the extent of area-wide contamination in the State of Washington (Subtask 3.4), designing the Yakima County Confirmation Sampling (Subtask 3.6), developing tools for use by local jurisdictions in defining their affected areas (Subtask 3.8), evaluating regional background concentrations (Subtask 3.9), and scoping the draft sampling guidance (Subtask 3.10).

For Task 4, future project work that will be informed by the interviews and literature reviews includes identifying a range of model remedies to address different categories of situations, evaluating the cost and practicality of those model remedies, identifying the appropriate cleanup standards, analyzing the human health and environmental implications of the model remedies, and developing recommendations (Subtask 4.4).

For Task 5, future project work that will be informed by the interviews and literature reviews includes investigating 3-5 case studies of institutional approaches (Subtask 5.3), identifying the range of institutional alternatives available for addressing problems in Washington State (Subtask 5.4), and analyzing the legal, funding, and institutional aspects of those alternatives (Subtasks 5.5, 5.6, and 5.7).

Ross & Associates will summarize the results of the information survey in a draft technical memorandum due to Ecology by April 5, 2002. The memorandum will identify each person interviewed as part of the information survey, indicate individuals who may be contacted for future reference, and provide summaries, organized by Task area, that integrate the results of the interviews and associated literature reviews. This technical memorandum will be available for the use of the Task Force, work groups, Agencies, and contractor team in the Area-Wide Soil Contamination Project.